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Internal Faculty Seminar

**Friday Nov. 19, 2021 (12-1pm)**

**ZOOM ID:**

**Speaker:**

Urbashi Mitra (USC)

**Title:**

Latent Privacy via a Secret Block Structure

**Abstract:**

Physical layer security approaches have often used the hardness of blind deconvolution to achieve privacy when transmitting signals over unknown wireless channels. Herein, we exploit the communication channel in a new way to provide a layer of privacy. In particular, we take advantage of the fact that it has been shown that exact recovery of block-sparse signals via linear measurements is achievable under conditions where classical compressed sensing would provably fail. We exploit this result to propose a novel private communication framework where secrecy is achieved by transmitting instances of an unidentifiable compressed sensing problem over a public channel. The legitimate receiver can attempt to overcome this ill-posedness by leveraging secret knowledge of a block structure that was used to encode the transmitter's message. We study the privacy guarantees of this communication protocol in a variety of cases with the goal of understanding how often we need to refresh the shared secret between transmitter and intended receiver. Additionally, we propose an algorithm for an eavesdropper to learn the block structure via the method of moments and highlight the privacy benefits of this framework through numerical experiments.